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Lapis Bufonis: The Growth and Decline of a Medical Superstition

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A variety of manuscripts on the treatment of man's ills was available to healers of the Middle Ages. Knowledge of therapeutics, set down by ancient scholars, was supplemented by contemporary theories and observations. The lore of healing was expounded not only in conventional medical texts but occasionally in bestiaries(1) and to a much greater extent in herbals. Additional repositories were the lapidaries, the manuscripts about precious and common stones and their virtues. Although little known to modern readers, in the Middle Ages these works were popular and influential, playing perhaps a larger role in medicine than did the herbals(2,3). Specific curative powers were ascribed to a long list of stones. A number of them, for example, were held to be valuable in pregnancy and childbirth(4).

One of the more curious lithotherapeutic items was the toad stone, of which there were said to be several forms, both real and imaginary.[1] The earliest mention I have found is a very brief reference to the *batrachites*, one of the numerous names for the toad stone, in the *Etymologies* of Bishop Isidore of Seville, dating from the beginning of the seventh century(5). There were much earlier lapidaries, but they seem to have had little medical content. Nearly five centuries later another bishop, Marbode of Rennes, wrote a popular and much copied lapidary(3,7). (It must be remembered that almost all the educated men of that time were clerics.) Marbode's work was a compilation of material from earlier authorities. From his manuscript and Isidore's, say Evans and Serjeantson, "the main

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[1] For this review I have drawn on a large number of printed lapidaries but have used few of those others, reportedly much more numerous(3), that exist only in manuscript form. The compilation of manuscript lapidaries did not end before the seventeenth century(2).

stream of the mediaeval tradition of the virtues of stones is derived."[2] But Marbode does not mention the toad stone.

A leading authority on lapidaries believes that the *Kyranides,* originating in Alexandria and translated in the twelfth century by Gerard of Cremona, were the origin of medieval ideas about the toad stone(8). The translation relates the tale of a stone that is found in a toad's head and that can be carried as an amulet for the cure of spleen and dropsy. Alexander Neckam (1157–1217), Abbot of Cirencester, in his long poem *In Praise of Divine Wisdom,* tells how the lowly toad serves mankind with the little stone in its head that drives out poisons. "If creeping things thus benefit us," asks Neckam gently, "then who should be called great?"(9).

Early in the thirteenth century a shadowy figure named Arnold of Saxony produced a short, anonymous lapidary manuscript, *De virtutibus lapidum.* His name for the toad stone was *Nose.* There are, he said,

> two kinds, one whitish, the other variegated. They are removed from the head of the toad shortly before it drinks or touches water. And with good luck sometimes there appears [in the stones] the outline of a toad with spotted feet. The stone is effective against the bite of reptiles and against poison. For when poison is present this variety of stone burns the finger it is touching. And so the two should be in contact(10).

In other words, the stone should be set in a ring so that the wearer can be warned by the stone's sudden heat.

Arnold's little book was a source for a contemporary, Albert, Count von Böllstadt, known for his achievements as Albertus Magnus(10). One of the greatest of the encyclopedists, he was a Dominican friar who became a bishop. One of his compilations was about minerals, and in it he set down what he had heard and read about the toad stone.

> Moreover they tell of a certain stone called *Borax,* so called from a toad which, it is said, carries [the stone] in its head. And [the stone] is of two kinds, one white, a little brownish, the other black. If extracted from the toad while it is still quivering in wine, [the stone] has a bluish eye in its center. They say that if this [stone] is swallowed it purges the filth and superfluities from the intestines, and in our time a small green one has been removed from a toad. Moreover we have seen other toads represented as having in them [stones] said to be of this kind. Indeed these stones are popularly called *crapodinae*(11).

One notes that Albertus Magnus was careful to separate hearsay from what he regarded as fact. But nevertheless he perpetuated an error that was to cause confusion for several centuries by his failure to distinguish between the toad stone and borax, a very real mineral. The Latin name he quoted, *crapodina,* obviously is related to the French word for toad. Finally, we observe that Albert, like Arnold, reported a therapeutic power of the stone.

[2] King points out that Pliny mentions varieties of a gem called *batrachites* but does not refer either to its origin from a toad or its protective and healing virtues. These, King suggests, were supplied by the imaginations of medieval scholars(6).

Another famous encyclopedist of the thirteenth century was Vincent of Burgundy. In his *Speculum naturale,* or *Mirror of Nature,* to be published in the following century as one of the great incunabula, he too wrote about the toad stone(12). There are two varieties, he said, of the gem borax, popularly called *crapondina.* The white one is better and more rare than the brown and black one. If the stone is not extracted from the toad until after death, then the blue eye that had existed in the stone's interior

> is extinguished by the malignancy of the [toad's] poison, and the stone is made impotent. This stone combats poisons; eaten in food it is said to purge internal evils from man. For it passes through the intestine and having purified the lower regions, it emerges. This stone is also called by another name, *nose,* as is shown by the following.

Vincent then quotes Arnold exactly (see above).

Thomas of Brabant and Bartholomew the Englishman, a Dominican and a Franciscan monk, respectively(13), also wrote in the thirteenth century about the stone. The latter's description, set into English and published in 1582, adds further detail.

> Bufo the Toade, whereof are divers kindes: some Toads that breed in Italy and about Naples, have in theyr heads a stone called a Crapo, of bignes like a big peach, but flat, of colour gray, with a browne spot in the midst, said to be of vertue. In times past, they were much worne, and used in ringes, as the forewarning against venime(14).

Thomas of Brabant's *On the Nature of Things* inspired a famous and very popular German compilation, *The Book of Nature,* written in 1350 by Conrad of Megenberg(13,15). The latter work was what we would call a natural history book, and of course it discussed frogs and toads. Conrad added to the terminological confusion by saying that "Borax means a large toad." He went on to assert that the toad is very poisonous, inflicting with its bite wounds that seldom heal. *Bufo,* said Conrad,

> may be called a little toad. The toad is a poisonous worm, has a treacherous face, and is unclean to the touch. It lives in the ground. . . . In Wales there is a kind of toad with a voice as loud as a trombone. If carried off from its homeland, it loses its voice. These toads are like the parson who will preach only in his native country. Alexander says that the toad happily eats sage and is never poisoned by its roots. Therefore one should plant rue in the places where sage was pulled up. The juice of the rue is a deadly poison, particularly for the toad.

And so on.[3]

Sir John Mandeville, allegedly the author of a fourteenth century book of *Travels,* said there were not two but three kinds of toad stone. The best was

[3] There is of course a huge natural history of frogs and toads, beginning with Aristotle. It is much too lengthy to review here, but interested readers will enjoy, among others, the detailed and sometimes lurid accounts to be found in the apocryphal *Subtilitatum,* incorrectly (16) ascribed to St. Hildegard of Bingen (1098–1180) (17), and in other early accounts from Pliny to Pennant and beyond(14,18–27). There are also summaries of European folk beliefs about toads(28–32).

white. The second "is the color of fruit, between black and white, and has an eye in the center; the third has the form of a toad in the middle and is of the color of wood blackened by fire." Each of the stones protected against poison and if swallowed whole not only would heal intestinal diseases but could later be recovered. Sir John went on to tell of a clergyman and his servant who found a toad with a knob on its head. Thinking that this object might be a toad stone, the cleric caught the animal and tied it securely in the sleeve of his coat until he got home. But when he arrived the sleeve was empty, although it was still tightly tied and had no hole in it. Therefore, concludes Sir John, "one would think [the stone] would be useful for captives who are in prison"(33).

Evans and Serjeantson have transcribed a late fifteenth century lapidary from Peterborough Cathedral, England(2). This account further expands the legend of the toad stone. It is found only in the head of a toad that is at least 7 years old. It confers great strength in battle and makes a man abound in worthiness. The stone is obtained by imprisoning a toad in a pot pierced with many holes; when this has been set on an ant hill, the ants consume the flesh, and the stone is left with the bones.

In 1485 there was printed in Mainz the famous *Hortus sanitatis*, or *Garden of Health*, by Johann von Cuba(21,34). This fascinating work, richly illustrated with woodcuts, was reprinted many times and in several languages. Although technically a herbal, it included sections on animals and on stones, among them that from the toad's head. Cuba's information, however, came from Arnold of Saxony and Albertus Magnus. The same was true for Leonardus' description of the stone in his *Speculum Lapidum*, printed in 1502, but he did add that *Borax, Nosa*, and *Crapondinus* are synonymous, and recommended the stone not only in poisoning but for the relief of fevers and of diseases of the stomach and kidneys. The stone should be applied in a lotion or worn on the body(35). And the great Erasmus wrote of a miraculous stone amulet from which the image of the toad shone forth(36). Eucharius Roesslin's *Kreutterbuch*, or herbal, described both the toad, with his "poisonous glance, stinking and filthy to the touch," and the purifying stone in its forehead(26).

Other sixteenth century compilers made the old claims and sometimes added new details about the stones called *borax* and *batrachites*, treating them sometimes chiefly as minerals(37–40), and sometimes as wonder-working charms. It was reported that the toad stone was formed on the forehead of the king of the toads from the spittle of his subjects. When the jewel was laid on the ground, toads leaped forward, crowding around to seize it. The stone was seen actually to sweat, not simply grow hot, in the presence of poison. When carried as an amulet it increased both the owner's virtue and his worldly goods. It was therapeutic in indigestion, picturesquely described as *laborantes stomacho*(39) and in erysipelas, swollen breasts in pregnancy, and renal calculus(2,20,23,38,39,41–44). This last may have been an application of the principle of *similia similibus curantur*. The stone would even prevent conception(40). The writer Lemnius reported that his family in France had a toad stone the size of a hazel nut which he had often used successfully to treat the bites of poisonous creatures. The in-

De Bozay. Chap. xxxii.

Bozay. La vipere bozay ſelon Albert eſt ainſi nõmee daucun genre de crapault. Et eſt ainſi dicte & appellee pource q̃l la porte en ſa teſte/ et en eſt de deux gẽres/ lune blãche aucun peu noire/ & lautre ſelle eſt extraicte du crapault eſtãt encores en vie et palpitãt elle a au meilleu vng oeil de coulour bleue. Et en noz tẽps en fut extraicte de vng crapault vne petite verte/ et auſſi auons

FIG. 1. Removing the toad stone, from the 1529 edition of *Le Jardin de Santé* (Paris, Philippe le Noir), a French translation of the *Hortus Sanitatis*. Courtesy of the Historical Library of the Yale Medical Library.

jury was simply rubbed with the stone(45). Another of the stones, set in a silver ring and preserved in the Monastery of St. Anne in Rome, was popularly believed to cure a fistula if rubbed around the lesion for 12 days(39). Conrad Gesner, the energetic but uncritical Swiss naturalist and encyclopedist, told how he obtained toad stones.

> I have lured [toads] more successfully than I have taken the stone from living animals by spreading pumice on a cloth of varied colors in which they delight. So, although they would otherwise be struggling, they are instead relaxed. They lay down the burden from their heads; it soon falls from an opening in the middle [of the cloth] into a casket placed underneath.

The hole in the cloth and the casket were necessary, it was claimed, because some toads resented giving up the stone and would try to swallow it(38). The toad stone legend gave Shakespeare his famous simile:

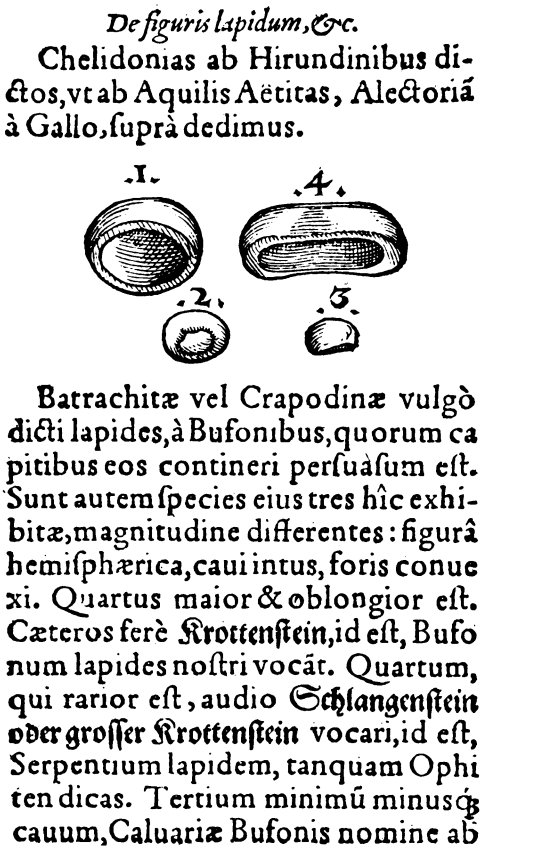

FIG. 2. Varieties of toad stone, as portrayed in Gesner's *De rerum fossilium, lapidum et gemmarum*(38). Courtesy of the Historical Library of the Yale Medical Library.

> Sweet are the uses of adversity,
> Which, like the toad, ugly and venomous,
> Wears yet a precious jewel in his head.
> (*As You Like It,* II, 1)

Sixteenth century compilers embellished tales of the toad stone(46–49). It was recommended for the cure of epilepsy and vertigo(47). It would release pregnant women, children, and cattle from bewitchment. "In the Plague it is laid to the heart to strengthen it. It draws Poyson out of the heart, and out of Carbuncles and Pestilent sores. It consumes, dissipates and softens all hardnesse, Tumours, and varices"(50).

It is a pleasure to report that in addition to all the credulous scholars there were a few sceptics. In his famous lapidary Anselmus Boetius de Boodt tells us:

> I remember that when I was a boy, I took an old toad and put it on a red cloth so that I could get the stone. . . . In truth although I watched the toad the whole night through he cast up nothing, and from that time I have considered what is reported about the toad stone and its origin to be nonsense.

Interestingly enough, de Boodt then goes on to give a long list of the curative properties of the stone. However, he mentions most of the alleged therapeutic effects without himself endorsing them, *e.g.*:

> It is particularly celebrated for relieving long existing kidney pain and for preventing the formation of calculi. For this it is proclaimed as a singular and infallible charm by jewelers greedy for a profit. There is nothing cheap about this stone, but it is not offered for sale for more than it is estimated by the seller to be wanted by the buyer(51).

Olaus Worm, a Danish contemporary of de Boodt, related with approval how the latter had disproved a superstition by testing a toad on a red cloth. But Worm was still convinced that the stone could heal. It would, he said, dispel a swelling caused by poisonous contact if vigorously rubbed on the lesion,

> an example of which I have seen in a colleague who collected *Esula major*[4] along with some other plants. While uprooting it, its juice stuck to his fingers, which he unwisely rubbed on his face. Suddenly it swelled prodigiously all over, but [my colleague] seizing from a bystander a ring which held this stone and rubbing the swollen place many times, it subsided within the hour(52).

A little later in the seventeenth century an interesting new idea about the toad stone was advanced by Dr. Christopher Merrett, an original Fellow of the Royal Society of London, a Fellow of the Royal College of Physicians, and a friend of William Harvey.

> I have demonstrated *Bufonius*, the Toad Stone, incorrectly so called, in the presence of His Most Serene Majesty the King . . . to be the molar teeth of the wolf fish, which I have seen in Schwenckfelt and Jonston's *De Pisc*[*ibus*], section 47. And the goldsmiths, greatly admiring, have acknowledged that these teeth are the true toad stones that they sell individually(58).

Merrett's opinion was confirmed, apparently about 1670, by one Agostino Scilla Pittore. We know of the latter's publication because of an anonymous summary of it, published in 1696 in the *Philosopical Transactions of the Royal Society*(59). Here the source of the teeth is identified as

> *Sargus Dentex* and *Aurata*, and other Fishes of that Tribe, which have round *Dentes Molares*, to grind the shells that they find at the bottom of the sea, that they may come at the Flesh upon which they live.

Robert Plot, antiquary and Oxford don, however, insisted that in addition to the molar tooth variety of toad stones there was also

> a certain reddish liver-colour'd real *Stone*, indeed of the form of those of a Shark-fish, i.e. like the *segment* of a *sphere*, convex at the top, and concave underneath . . . but found amongst the Gravel in *Magdalen coll.* Walks . . .(60).

Edward Lhuyd, Plot's assistant, accepted Merrett's idea(61), as did the sagacious Sir Thomas Browne. Earlier editions of his *Pseudodoxica epidemica* did not mention the dental variety of toad stones, but to the edition of 1672 he added a paragraph stating that toad stones are

[4] *Esula major*, more recently *Pityusa major*, would now be classed with the *Euphorbiae* or spurges(53–56). Some members of this family are vesicant and poisonous(57).

> handsomely contrived out of the teeth of the *Lupus Marinus*, a Fish often taken in our Northern Seas, as was publickly declared by an eminent and learned Physitian. But because men are unwilling to conceive so low of their Toadstones, which they so highly value, they make some trial thereof by a candent or red hot Iron applied unto the hollow and unpolished part thereof, whereupon if they be true stones that will not be apt to burn or afford a burnt odour, which they may be apt to do, if contrived out of animal parts or the teeth of fishes(18).

A modern view is that the true toad stone "is really the palatal tooth of a fossil fish called Lepidotus, common in the oolitic and wealden strata of England"(62,63).

Controversy over the healing virtues of toad stones continued in the seventeenth and eighteenth centuries. Pierre Pomet (1658–1699), author of *A Compleat History of Drugs,* vigorously denied that the stones would relieve poisoning or cure disease:

> all these Virtues are imaginary, for the Toad-Stone has nothing in it but an alcaline Quality proper to absorb Acids, and to stop Looseness, taken from a Scruple to half a Dram; but it is not in Use(64).

James agreed in his *Medicinal Directory*(65). Other compilers took other positions or simply described the stone(66–75). Nineteenth century collectors of folklore found toad stone superstitions to be widespread and more embellished than ever. The magic gem would stop bleeding, prevent miscarriages, encourage lactation, cure diseases of the breast, and even help in love making. If it was hidden behind a manger by the stable boys, no harm could come to the horses and the cows would thrive(32,76–84).

Sir Walter Scott wrote on 4 April 1812 to Joanna Baillie about his

> toadstone—a celebrated amulet, which was never lent to anyone unless upon a bond for a thousand merks [*sic*] for its being safely restored. It was sovereign for protecting new-born children and their mothers from the power of the fairies, and has been repeatedly borrowed from my mother, on account of this virtue(85).

A toad stone mounted in gold was recorded as part of the Canterbury Treasure in 1321, and others belonged to James II of Scotland and to fourteenth century French dukes. A stone was fastened in the bottom of an ancient and precious crystal cup, probably to warn against poison(8,86,87). Another stone, set in gold, was thought worthy of presentation to Elizabeth I(88), and a toad stone locket was discovered in the grave of one of her subjects(89). In 1616 a gold ring bearing the gem was given as security that a marriage would be performed(29). And Kaiser Wilhelm II, figurehead of evil in World War I, owned a toad stone talisman that was handed down among the Hohenzollerns(84,90). Even "a gold Ring with a large counterfeited Toad stone" was precious. When this and other jewelry were stolen in London on the afternoon of 18 August 1679 from "out of a Ground-Chamber, under the Arch going into the second Court at St. James," the disconsolate owner advertised a reward of a guinea in *The London Gazette*(91).

The tale of the toad stone shows us how a medical superstition developed and ultimately faded. Engendered by an error, perpetuated by a combination of scholastic authority and human need for help and reassurance, and nourished by fertile imaginations, the story flourished as long as it was believed.

REFERENCES

1. Forbes, T. R., Medical lore in the bestiaries. *Med. History* **12,** 245–253 (1968).
2. Evans, Joan, and Serjeantson, M. S., *English Medieval Lapidaries.* pp. xi, xii, 79, 129. Early English Text Society, London, 1933.
3. Riddle, J. M., Lithotherapy in the Middle Ages. *Pharmacy in History* **12,** 39–50 (1970).
4. Forbes, T. R., *The Midwife and the Witch.* pp. 64–79. Yale Univ. Press, New Haven, 1966.
5. Isidorus Hispalensis episcopus., *Etymologiarum.* Vol. 2. Oxford Univ. Press, London, 1962.
6. King, C. W., *Antique Gems.* pp. 463–465. London, John Murray, 1860.
7. Sarton, George, *Introduction to the History of Science.* pp. 764–765. Vol. 1. Williams & Wilkins, Baltimore, 1927.
8. Evans, Joan, *Magical Jewels of the Middle Ages and Renaissance.* pp. 17, 19, 118, 223, 226. Clarendon Press, Oxford, 1922.
9. Wright, Thomas, ed., *De laudibus divinae sapientiae.* p. 468, lines 229–232. Longmans, Green, London, 1863.
10. Rose, Valentin, Aristoteles De lapidibus et Arnoldus Saxo. *Z. Deut. Altertum* **18,** 321–455 (1875).
11. Albertus Magnus, *De mineralibus.* Colonia, Ioannis Birckmannus, p. 124, 1569.
12. Vincentius Bellovacensis, *Speculum naturale.* Lib. 9, cap. 49. [Anton Koberger, Nürnberg, ca. 1486].
13. Garrison, F. H., *An Introduction to the History of Medicine.* p. 165. W. B. Saunders, Philadelphia, 1929.
14. Batman, Stephen, *Batman uppon Bartholome, his booke De Proprietatibus rerum.* Lib. 18, cap. 17, pp. 351–352. Thomas East, London, 1582.
15. Schulz, Hugo, ed., *Das Buch der Natur von Conrad von Megenberg.* pp. 251–252, 375–376. Julius Abel, Greifswald, 1897.
16. Singer, C., ed., *Studies in the History and Method of Science.* p. 13. Clarendon Press, Oxford, 1917.
17. Hildegardis, S., *Subtilitatum. in Patrologiae.* (Migne, J.-P., ed.). Vol. **197,** Lib. 8, col. 1341–1342. J.-P. Migne, Paris, 1855.
18. Browne, Thomas, *Pseudodoxia epidemica.* Bk. 3, chap 13, p. 151. London, J. R. for Nath. Ekins, 1672.
19. Deonna, W., La femme et la grenouille. *Gaz. des Beaux-Arts,* **40,** 229–240 (1952).
20. Gesnerus, Conradus, *Historiae animalium.* Lib. 2, pp. 64–72. Ioannis Wechelus, Francofurdus, 1586.
21. Hudson, Noel, *An Early English Version of Hortus Sanitatis.* pp. 23–24. Bernard Quaritsch, London, 1954.
22. Littré, M. E., *Histoire naturelle de Pline.* Tome 2, livre 25, 76, p. 186. J. J. Dubochet, Le Chevalier, Paris, 1850.
23. Lonicer, Adam, *Vollständiges Kräuter-Buch.* pp. 625–626, 727. Joseph Wolff, Augsburg, 1783.
24. Marzell, Heinrich, Die Kröte als Pestmittel bei Paracelsus. *Med. Welt* pp. 2441–2443, 1966.
25. Pennant, Thomas, *British Zoology.* Vol. 3, 18–21. Wilkie and Robinson, London, 1812.
26. [Roesslin, E.], Kreutterbüch. pp. 11, 56. Christian Egenolff, Franckenfurt am Meyn, 1535.
27. Villiers, Elizabeth, *Amulette und Talismane.* pp. 144–145. Drei Masken, Berlin, 1927.
28. Bächtold-Stäubli, Hanns, *Handwörterbuch des deutschen Aberglaubens.* pp. 631–633. Walter de Gruyter, Berlin, 1932, 5.

29. Dalyell, J. G., *The Darker Superstitions of Scotland.* pp. 406–409. Waugh and Innes, Edinburgh, 1834.
30. Erich, O. A., and Beitl, Richard, Editors, *Wörterbuch des deutschen Volkskunde.* pp. 446–447. Alfred Kröner, Stuttgart, 1955.
31. Hastings, James, Editor, *Encyclopaedia of Religion and Ethics.* **1,** pp. 516–517. Scribner's, New York, 1908.
32. Hovorka, O. von, and Kronfeld, A., *Vergleichende Volksmedizin.* **1,** pp. 262–263. Strecker & Schröder, Stuttgart, 1909.
33. del Sotto, Is., *Le lapidaire du quatorzième siécle.* pp. 90–91. Imprimerie Impériale, Vienne, 1862.
34. [Anon.], *Le jardin de santé.* Vol. 2, fol. 70 verso. Philippe le Noir, Paris, [1529].
35. Leonardus, Camillus, *Speculum lapidum.* fol. 25 recto. J. B. Sessa, Venetia, 1502.
36. deVocht, Henry, *The Earliest English Translations of Erasmus' Colloquia.* p. 157. Librairie Universitaire, Louvain, 1928.
37. Agricola, Georgius, *De natura fossilium.* pp. 6, 116, 144. Geological Society of America, New York, 1955.
38. Gesnerus, Conradus, *De rerum fossilium, lapidum et gemmarum.* fol. 161 verso, 162 recto. Tigurus, [no pub.], 1565.
39. Mercati, Michaelis, *Metallotheca.* pp. 184–186. J. B. Salviani, Roma, 1719.
40. Schwenckfeld, Casp, *Theriotropheum Silesiae.* p. 161. David Albertus, Lignicius, 1603.
41. Cardanus, Hierome, *De la subtilité.* p. 145. Guillaume le Noir, Paris, 1556.
42. Encelius, Christophorus, *De re metallica.* Lib. 3, cap. 37, pp. 220–221. Christianus Egenolph, Franc[ofurtus], 1557.
43. [Lupton, Thomas], *A Thousand Notable Things.* pp. 10, 120, 130. E. All-de for N. Fosbrooke, London, 1627.
44. Mizaldus, Anton, *Memorabilium.* Cent. 3, 3, fol. 31 recto. Federicus Morellus, Lutetia, 1566.
45. Lemnius, Levinus, *Occulta naturae miracula.* Lib. 7, cap. 18, pp. 527–528. Christian Guth, Frankfurt, 1572.
46. Baccius, Andrea, *De gemmis et lapidibus pretiosis.* cap. 41, pp. 216–218. Matthias Beckerus, Francofurtus, 1603.
47. Aldrovandi, Ulyssis, *Musaeum metallicum.* pp. 810–816. I. B. Ferronius, Bononia, 1648.
48. Topsel, E., *The History of Four-footed Beasts and Serpents.* pp. 726–727. E. Cotes, London, 1658.
49. Nicols, Thomas, *Edelgestein-Büchlein.* chap. 36, pp. 162–164. Johann Naumann und Georg Wolff, Hamburg, 1675.
50. Jonstonus, Johannes, *An History of the Wonderful Things of Nature.* p. 114. John Streeter, London, 1657.
51. de Boodt, A. B., *Gemmarum et lapidum historia.* Lib. 2, cap. 149–151, pp. 152–153. Typis Wechelianis, Hanovia, 1609.
52. Worm, Olao, *Museum Wormianum.* L. and D. Elzevirios, Amstelodam, 1655. [Cited by: Bates, William: The toadstone. *Notes and Queries,* 1871, 4th ser., **7,** 540–542].
53. Dodonaeus, R., *Stirpium historia commentariorum.* p. 362. Ioannis Loeus, Antverpia, 1553.
54. Durant, Castore, *Hortulus sanitatis.* p. 765. Nicolanus Hoffman, Franckfort am Meyn, 1609.
55. Gray, Asa, *First Lessons in Botany.* p. 388. Ivison, Phinney, Blakeman, New York, 1865.
56. Matthiolus, P. A., *De plantis epitome utilissima.* p. 967. [no pub.], Francofurtus ad Moenum, 1586.
57. Andrews, G. C., and Komonkos, A. N., *Diseases of the Skin.* pp. 68–69. Saunders, Philadelphia.
58. Merrett, Christophorus, *Pinax rerum naturalium.* col. 210. T. Rycroft, Londinus, 1667.
59. Scilla Pittore, Agostino, La vana speculatione disingannata dal senso. *Phil. Trans. Roy. Soc. London* **19,** 181–195 (1696).
60. Plot, Robert, *The Natural History of Oxford-shire.* p. 128. Oxford, [no. pub.], 1677.
61. Luidius, Eduardus, Epistola, in qua agit de lapidibus. *Phil. Trans. Roy. Soc. London* **17,** 746–754 (1693).

62. Dalton, O. M., *Catalogue of the Finger Rings.* pp. xiv-xvi. British Museum, London, 1912.
63. Lankester, Ray, *Science from an Easy Chair.* p. 90. Henry Holt, New York, 1913.
64. Pomet, Pierre, *A Compleat History of Drugs.* Vol. 2, book 5, pp. 411–412. R. Bonwicke, London, 1712.
65. James, R., *A Medicinal Dictionary.* Vol. 1, [no pp.]. T. Osborne, London, 1743.
66. Bacon, Francis, *Sylva sylvarum.* Cent. 10, no. 97, p. 251. W. Lee, London, 1631.
67. Boyle, Robert, *An Essay about the Origine & Virtues of Gems.* p. 3. William Godbid, London, 1672.
68. Brückmann, U. F. B., *Abhandlung für Edelsteinen.* p. 343. Waysenhaus, Braunschweig, 1773.
69. Culpeper, N., Pharmacopoeia Londinensis. p. 50. Peter Cole, London, 1659.
70. Grew, Nehemjah, *Musaeum Regalis Societatis.* p. 299. W. Rawlins, London, 1681.
71. Kräutermann, Valentino, Der curieuse und vernünfftige Zauber-Artzt. cap. 9, pp. 288–289. E. L. Niedt, Arnstadt, 1730.
72. Lovell, Robert, Panmineralogicon. p. 100. W. Hall, Oxford, 1661.
73. Sloane, Hans, Extracts of Several Letters from Mr. Edward Lhwyd. *Phil. Trans. Roy. Soc. London* **28,** 93–101 (1713).
74. Valentini, M. B., *Museum museorum.* p. 64. J. D. Zunner, Franckfurt am Mayn, (1704).
75. Zedler, J. H., *Grosses vollständiges Lexicon* **3,** 692–693 (1733).
76. Bartsch, Karl, *Sagen, Märchen und Gebräuche aus Mehlenburg.* pp. 355, 489. Wilhelm Braumüller, Wien, 1880.
77. C., H. S., A toad stone ring. *Notes and Queries* 4th ser. **7,** 324 (1871).
78. Davidson, John, Crapaudine. *Notes and Queries 3rd ser.* **5,** 142–143 (1864).
79. Dörler, A. F., Die Tierwelt in der sympathetischen Tiroler Volksmedizin. *Z. Vereins Volkskundes* **8,** 38–48, 168–180 (1898).
80. Haupt, Karl, *Sagenbuch der Lausitz.* p. 247. Wilhelm Engelmann, Leipzig, 1862.
81. Jahn, Ulrich, Hexenwesen und Zauberei in Pommern. p. 195. Herrcke & Lebeling, Stettin, 1886.
82. Juhling, Johannes, *Die Tiere in der deutschen Volksmedizin alter und neuer Zeit.* p. 117. R. Schulze, Mittweida, 1900.
83. Lammert, G., *Volksmedizin und medizinischer Aberglaube in Bayern.* p. 176. F. A. Julien, Würzburg, 1869.
84. Seligmann, S., *Die magischen Heil- und Schutmittel.* pp. 221–222. Strecker und Schröder, Stuttgart, 1927.
85. Lockhart, J. G., *Memoirs of the Life of Sir Walter Scott, Bart.* Vol. 1, p. 415. Carey, Lea, & Blanchard, Philadelphia, 1837.
86. Jones, William, *Finger-ring Lore.* pp. 156–158. Chatto & Windus, London, 1890.
87. Labarte, Jules, *Handbook of the Arts of the Middle Ages and Renaissance.* pp. xxvi-xxvii. John Murray, London, 1855.
88. Nichols, John, *The Progresses and Public Processions of Queen Elizabeth.* Vol. 2, p. 539. Burt Franklin, New York [1968]. 24 Nov. 1588.
89. Tomlinson, C., Toad-stones. *Notes and Queries* **8,** 65–66 (1895).
90. McKenzie, Dan, *The Infancy of Medicine.* p. 208. Macmillan, London, 1927.
91. [Anon.], Advertisements. *The London Gazette.* 1435/4, 18–21 August, 1679.